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fication, and methods of exploration for iron ore. Chapter iv, on magnetic observations, gives a rather full explanation of the instruments used, the interpretation of observations made with them, and their capabilities and limitations.

Part II consists of the detailed township maps and the accompanying descriptions. Each township is fully described under the following heads: surface features, glacial drift, general geology, magnetic observations, land classification, and recommendations for exploration.

H. R. B.

Coal Resources of District VIII (Danville), Illinois. By F. H. KAY and K. D. WHITE. Ill. State Geol. Survey, Coal Mining Investigations, Bull. No. 14, 1915. Pp. 68, pls. 7, figs. 10.

The geology of a part of this district has been described by M. R. Campbell in the Danville Folio of the U.S. Geological Survey. The present bulletin treats chiefly of the coal resources. The principal coals are in the upper Carbondale and lower McLeansboro formations. Lenticular masses of shale locally called "rolls" are common within the coal beds. Their present shape is the result of depositions in small basins and the subsequent settling of the somewhat plastic incompressible clay into the highly compressible vegetal mass. More than 58,000,000 tons of coal have been mined in this district since 1880; 1,494,000,000 tons remain in the ground.

H. R. B.

Newly Discovered Beds of Extinct Lakes in Southern and Western Illinois and Adjacent States. By E. W. Shaw. Ill. Geol. Survey, Bull. 20, 1915. Pp. 141-57.

During some parts of Pleistocene times aggradation by the Ohio and Mississippi rivers exceeded that of certain of their tributaries—those which received little glacial drainage. The valley fillings of the master-streams therefore dammed these tributaries, and lakes formed in their lower courses. The deposits that were laid down in these ponded waters are about 100 feet thick at the mouths of the tributaries and thin out upstream. The Big Muddy River is a typical case.

Shore features are poorly developed except along the Pond River near Madisonville, Ky., 50 miles from the Ohio River. The lakes were relatively short-lived, and their levels were subject to considerable fluctuations, owing to the great range of high and low water of the major streams.

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There were two periods of lake development. During the intervening epoch the first deposit was almost cut through. The two stages of filling are now marked by terraces, the later of the two being 10 feet to 20 feet lower than the first.

The older of the two stages is younger than the Illinois till—probably of late Illinoian age. The other is "in or near Wisconsin time."

H. R. B.

The Ellamar District, Alaska. By S. R. CAPPS and B. L. JOHNSON. U.S. Geol. Survey, Bull. No. 605, 1915. Pp. 125, pls. 10, figs. 10.

Previous writers have considered that the copper deposits of the Prince William Sound region are genetically related to basic lavas, being formed either as concentrations of disseminated copper minerals of these greenstones or in connection with basic intrusives. The deposits are in shear zones along fault planes, principally in the greenstones. The ores carry, besides copper, some gold and silver. The minerals are chiefly sulphides, chalcopyrite, pyrrhotite, and pyrite predominating, with smaller amounts of sphalerite, galena, and arsenopyrite. The ore minerals cement or replace the shattered country rock. Quartz-filled fissures carrying similar minerals are less common. The evidence obtained indicates that the deposits were formed by primary sulphide impregnation along the fracture zones by rising magmatic solutions. Both the gold and copper veins of this region are believed to have been formed during a single period of mineralization closely following and genetically related to the late Mesozoic granitic intrusives.

H. R. B.

Mineralogy, Crystallography and Blowpipe Analysis, 5th edition. By Moses and Parsons. New York: Van Nostrand & Co. (1916). Pp. xiii+631, figs. 575.

The new edition has been expanded by the addition of new economic groups, by the discussion of origin and association of minerals, by added discussion of crystal optics, and by new determinative tables. The economic basis for classification is retained and emphasized, though many minerals of no economic importance are included. Perhaps the greatest difficulty arising from this classification is in the breaking up of customary crystallographic groups. For example, the rhombohedral carbonates must be sought out by looking through the calcium, mag-